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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,757	06/27/2003	Yao Wang	EMC-01-141CIP2	7174

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EXAMINER	
ADAMS, CHARLES D	

ART UNIT	PAPER NUMBER
2164	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/608,757	WANG ET AL.	
	Examiner	Art Unit	
	CHARLES D. ADAMS	2164	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 February 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Remarks

1. In response to communications filed on 2 February 2009, claims 1, 6, 10, and 14 are amended. Claims 1-17 are pending in the application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sicola et al. (US Pre-Grant Publication 2004/0064639) in view of Glenn et al. (US Patent 5,852,724), and further in view of Mashayekhi et al. (US Patent 6,922,791).

As to claim 1, Sicola et al. teaches:

A data transfer server (see paragraphs [0049] and [0054]);

a primary software agent hosted on said data storage system comprising independent storage devices, said primary software agent, in communication with the data transfer server, the primary software agent configured for performing data transfer operations in response to commands from the data transfer server (see paragraphs [0049], "storage array controllers", [0058], "remote copy set operation", and [0050],

which teaches 'host' and 'disaster-tolerant' paths. Also see paragraph [0054], which discusses software running on the hosts, that is used for dynamic failover between storage paths);

One or more failover software agents, each failover software agent residing on a host, in communication over a network with the primary software agent, the data transfer server, and at least one of the two data storage systems, the failover software agents being remote from the primary software agent (see paragraphs [0049]-[0051], [0054] and Figure 2. All storage subsystems and all hosts are visible to each other over the SAN. Therefore, as they are connected by various network components, they are remote),

Sicola et al. does not explicitly teach and wherein each of said failover software agents is configured to execute scripts residing on the host to control host applications;

Glenn et al. teaches wherein each of said failover software agents is configured to execute scripts residing on the host to control host applications (see 8:15-36);

Sicola et al. as modified does not explicitly teach wherein said primary software agent further represents a failover software agent for another of said primary software agents in another one of said data storage systems;

Mashayekhi et al. teaches wherein said primary software agent further represents a failover software agent for another of said primary software agents in another one of said data storage systems (see Mashayekhi et al. 6:25-38 and 1:58-16, and 7:42-51 and Figure 2a. There are multiple ways listed in Mashayekhi et al. which

provide for a primary software agent serving as a failover agent for another primary agent);

Sicola et al. as modified teaches:

A failover protocol for determining an order which said software agents, within a communication path of a data transfer, are designated to take over the data transfer operation and execute scripts residing on the host to control host applications in response to one or more data transfer commands when a failure of one or more of said software agents is determined, said protocol being determined during configuration of said computer architecture (see Mashaykhi et al. 6:25-38 and 1:58-16 and Sicola et al. paragraph [0054]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Sicola et al. by the teachings of Glenn et al., because Glenn et al. teaches "Each server also has a unique node name by which the other servers connected to it over a private network may monitor the status of each other. Upon detecting a primary server failure, the secondary server takes control of the public network. Due to the common node name, the secondary server can take control of several primary servers servicing different public networks" (see Glenn et al. 1:61-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Sicola et al. by the teaching of Mashayekhi et al., since Mashayekhi et al. teaches that "the implementation of a failover

policy can be crucial when considering the overall high availability of a cluster" (see 1:28-30).

As to claim 2, Sicola et al. as modified teaches wherein the data transfer operation is a replication of data within the data storage environment (see Sicola et al. paragraph [0058]).

As to claim 3, Sicola et al. as modified teaches wherein server commands to the software agents are sent over a network in accordance with an IP protocol (see Sicola et al. paragraph [0053]).

As to claim 4, Sicola et al. as modified teaches wherein the software agents communicate with the at least one data storage system over the network in accordance with a Fibre Channel protocol (see Sicola et al. paragraph [0052]).

As to claim 5, Sicola et al. as modified teaches wherein a predetermined hierarchal relationship is followed by the data transfer server to select the order in which the failover software agents are commanded to take over the work of the one or more determined failed software agents (see Mashayekhi et al. 6:25-38 and 1:58-16, and 7:42-51).

As to claim 6, Sicola et al. teaches:

A data replication management server (see paragraphs [0049] and [0054]);

A software agent, designated as primary software agent, hosted on said data storage system, said data storage system comprising independent storage devices, said primary software agent, in communication with at least one of the two data storage systems and the data replication management server, the primary software agent configured for performing data replication operations in response to commands from the data replication management server (see paragraphs [0049]-[0050], [0054], and paragraph [0058]);

One or more failover software agents, each failover software agent residing on a host, in communication over a network with the primary software agent, the data replication management server, and at least one of the two data storage systems, the failover software agents being remote from the primary software agent (see paragraphs [0049]-[0051], [0054] and Figure 2)

Sicola et al. does not explicitly teach and wherein each of said failover software agents is configured to execute scripts residing on the host to control host applications

Glenn et al. teaches and wherein each of said failover software agents is configured to execute scripts residing on the host to control host applications (see 8:15-36);

Sicola et al. as modified does not explicitly teach wherein said primary software agent further represents a failover software agent for another of said primary software agents in another one of said data storage systems;

Mashayekhi et al. teaches wherein said primary software agent further represents a failover software agent for another of said primary software agents in another one of said data storage systems (see Mashayekhi et al. 6:25-38 and 1:58-2:16, and 7:42-51 and Figure 2a);

Sicola et al. as modified teaches a failover protocol for determining an order in which said software agents, within a communication path of a data transfer (see Sicola et al. paragraphs [0049]-[0052] and Figure 2), are designated to take over the data transfer operation and execute scripts residing on the host to control host applications in response to one or more data transfer commands when a failure of one or more of said software agents is determined, said protocol being determined during configuration of said computer architecture (see Mashayekhi et al. 6:25-38 and 1:58-16, and 7:42-51 and Sicola et al. paragraph [0054]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Sicola et al. by the teachings of Glenn et al., because Glenn et al. teaches "Each server also has a unique node name by which the other servers connected to it over a private network may monitor the status of each other. Upon detecting a primary server failure, the secondary server takes control of the public network. Due to the common node name, the secondary server can take control of several primary servers servicing different public networks" (see Glenn et al. 1:61-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Sicola et al. by the teaching of

Mashayekhi et al., since Mashayekhi et al. teaches that "the implementation of a failover policy can be crucial when considering the overall high availability of a cluster" (see 1:28-30).

As to claim 7, Sicola et al. as modified teaches wherein server commands to the software agents are sent over a network in accordance with an IP protocol (see paragraph [0053]. An "Internet Link" would inherently use an "IP protocol").

As to claim 8, Sicola et al. as modified teaches wherein the software agents communicate with the at least one data storage system over the network in accordance with a Fibre Channel protocol (see paragraph [0052]).

As to claim 9, Sicola et al. as modified teaches wherein the data replication management server uses a predetermined hierarchal relationship to select the order in which designated ones of the failover software agents are commanded to take over the work of the one or more determined failed software agents (see Mashayekhi et al. 6:25-38 and 1:58-16, and 7:42-51).

As to claim 10, Sicola et al. teaches a method for managing fault-tolerant resources for replication of data stored in a data storage environment including at least two data storage systems, and wherein data is replicated (see paragraph [0058]) from one of the at least two data storage systems to at least one other data storage system

of the at least two data storage systems (see paragraph [0049]), and at least one software agent in communication with at least one data replication management server for managing the fault tolerant resources (see paragraph [0049]), the method comprising:

configuring one or more software agents as failover agents, each failover software agent residing on a host, that are in remote communication over a network with another software agent, designated as primary software agent,

Sicola et al. does not teach and wherein each of said failover software agents is configured to execute scripts residing on the host to control host applications;

Glenn et al. teaches and wherein each of said failover software agents is configured to execute scripts residing on the host to control host applications (see 8:15-36);

Sicola et al. as modified teaches which is also in communication with the data replication management server, and at least one of the two data storage systems (see Sicola et al. paragraphs [0049]-[0051], [0054] and [0058])

Sicola et al. does not teach wherein said primary software agent further represents a failover software agent for another of said primary software agents in another one of said data storage systems;

Mashayekhi et al. teaches wherein said primary software agent further represents a failover software agent for another of said primary software agents in another one of said data storage systems (see Mashayekhi et al. 6:25-38 and 1:58-2:16, and 7:42-51 and Figure 2a);

Sicola et al. as modified teaches establishing a failover protocol for determining an order in which said software agents, within a communication path of the data transfer (see Sicola et al. paragraphs [0049]-[0052] and Figure 2), are designated to take over the data transfer operation and execute scripts residing on the host to control host applications in response to one or more data transfer commands when a failure of one or more of said software agents is determined, said protocol being determined during configuration of said computer architecture (see Mashayekhi et al. 6:25-38 and 1:58-16, and 7:42-51 and Sicola et al. paragraph [0054]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Sicola et al. by the teachings of Glenn et al., because Glenn et al. teaches "Each server also has a unique node name by which the other servers connected to it over a private network may monitor the status of each other. Upon detecting a primary server failure, the secondary server takes control of the public network. Due to the common node name, the secondary server can take control of several primary servers servicing different public networks" (see Glenn et al. 1:61-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Sicola et al. by the teaching of Mashayekhi et al., since Mashayekhi et al. teaches that "the implementation of a failover policy can be crucial when considering the overall high availability of a cluster" (see 1:28-30).

As to claim 11, Sicola et al. as modified teaches wherein server commands to the software agents are sent over a network in accordance with an IP protocol (see paragraph [0053]).

As to claim 12, Sicola et al. teaches wherein the software agents communicate with the at least one data storage system over the network in accordance with a Fibre Channel protocol (see paragraph [0052]).

As to claim 13, Sicola et al. as modified teaches wherein the data replication management server uses a predetermined hierarchal relationship to select the order in which designated ones of the failover software agents is commanded to take over the work of the one or more determined failed software agents (see Mashayekhi et al. 6:25-38 and 1:58-16, and 7:42-51).

As to claim 14, Sicola et al. as modified teaches:

A data replication management server (see paragraphs [0049] and [0054]);

A software agent, designated as primary software agent, hosted on said data storage system, said primary software agent in communication with at least one of the two data storage systems and the data replication management server, the primary software agent configured for performing data replication operations in response to commands from the data replication management server (see paragraphs [0049]-[0050], [0054] and [0058]);

One or more failover software agents, each failover software agent residing on a host, in communication over a network with the primary software agent, the data replication management server, and at least one of the two data storage systems, the failover software agents being remote from the primary software agent (see paragraphs [0049]-[0051], [0054] and Figure 2);

Sicola et al. does not explicitly teach and wherein each of said failover software agents is configured to execute scripts residing on the host to control host applications,

Glenn et al. teaches and wherein each of said failover software agents is configured to execute scripts residing on the host to control host applications (see 8:15-36),

Sicola et al. does not explicitly teach wherein said primary software agent further represents a failover software agent for another of said primary software agents in another one of said data storage systems;

Mashayekhi et al. teaches wherein said primary software agent further represents a failover software agent for another of said primary software agents in another one of said data storage systems (see Mashayekhi et al. 6:25-38 and 1:58-16, and 7:42-51 and Figure 2a);

Sicola et al. as modified teaches a computer-executable program for carrying out a failover protocol for determining an order in which said software agents, within a communication path of the data transfer (see Sicola et al. paragraphs [0049]-[0052] and Figure 2), are designated to take over the data transfer operation and execute scripts residing on the host to control host applications in response to one or more data transfer

commands when a failure of one or more of said software agents is determined (see Mashayekhi et al. 6:25-38 and 1:58-2:16, and 7:42-51 and Sicola et al. paragraph [0054]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Sicola et al. by the teachings of Glenn et al., because Glenn et al. teaches "Each server also has a unique node name by which the other servers connected to it over a private network may monitor the status of each other. Upon detecting a primary server failure, the secondary server takes control of the public network. Due to the common node name, the secondary server can take control of several primary servers servicing different public networks" (see Glenn et al. 1:61-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Sicola et al. by the teaching of Mashayekhi et al., since Mashayekhi et al. teaches that "the implementation of a failover policy can be crucial when considering the overall high availability of a cluster" (see 1:28-30).

As to claim 15, Sicola et al. as modified teaches wherein server commands to the software agents are sent over a network in accordance with an IP protocol (see paragraph [0053]. An "Internet Link" would inherently use an "IP protocol").

As to claim 16, Sicola et al. as modified teaches wherein the software agents communicate with the at least one data storage system over the network in accordance with a Fibre Channel protocol (see paragraph [0052]).

As to claim 17, Sicola et al. as modified teaches wherein the data replication management server uses a predetermined hierarchal relationship to select the order in which designated ones of the failover software agents are commanded to take over the work of the one or more determined failed software agents (see Mashayekhi et al. 6:25-38 and 1:58-16, and 7:42-51).

Response to Arguments

4. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHARLES D. ADAMS whose telephone number is (571)272-3938. The examiner can normally be reached on 8:30 AM - 5:00 PM, M - F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Rones can be reached on (571) 272-4085. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. D. A./
Examiner, Art Unit 2164

/Charles Rones/
Supervisory Patent Examiner, Art Unit 2164